

Application No. 09/536,27

Amendment dated December 17, 2003 (accompanying RCE)

Reply to Final office Action dated September 25, 2003

## REMARKS/ARGUMENTS

Applicant wishes to thank the Examiner for considering the present application. Claims 1-34 are pending in the application. Applicants respectfully request the Examiner to reconsider the rejections.

The Applicant submits herewith a revised copy of Figures 1 and 2 to correct a numbering inconsistency with the specification. The specification was also modified to correct the numbering inconsistencies.

Claims 1, 3-7, 9-10, 12-15, 17, 19-20, 22-23 and 25-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Taormina et al* (U.S. Patent No. 6,257,526) in view of *Roederer et al.* (U.S. Patent No. 5,151,706). Applicant respectfully traverses.

The *Taormina* reference describes a first deployment of a plurality of satellites in a medium earth orbit and later deployments of pluralities of satellites in the medium earth orbit. If demand on the satellite constellation is increased further, more medium earth satellites may be deployed. However, if spacing between the MEO satellites becomes too small, the satellites may be deployed in an inclined orbit 38. (See for example Abstract and col. 5, lines 24-40.) Although sub-geosynchronous orbits are described, the *Taormina* reference neither teaches nor suggests, for example, "a plurality of satellites located in an **elliptical** sub-geosynchronous orbit with respect to the earth, **said satellites operating in a service area in a synchronized manner to provide continuous coverage to said service area,**" as recited for example in Claim 1. The inclined elliptic sub-geosynchronous orbits (SGSO) satellites do not have a sidereal day period (see for example page 8, lines 12-19). The period (simplified) is a fraction of a sidereal day (see for example page 14). The Applicant agrees with

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the Examiner that variable beam widths to obtain a substantially uniform cell size is not shown in *Taormina*.

The *Roederer* reference is directed to an antenna configuration that has variable beam widths. The *Roederer* reference is set forth by the Examiner as disclosing generating a plurality of beams with variable beam widths to obtain a substantially uniform cell size covering said service area. The Examiner points to col. 6, lines 43-51 and col. 7, lines 8-10 for this. However, the *Roederer* reference does not cure, for example, the aforementioned deficiency in teaching of the *Taormina* reference and, therefore, it is respectfully submitted that Claim 1 is allowable over the *Taormina* and *Roederer* references. Further, no suggestion is provided in *Roederer* for use in a system with more than one satellite so that the satellites operate in a service area in a synchronized manner to provide continuous coverage to the service area. Also, although the illumination zone is described as able to be constant in *Roederer*, no suggestion is provided for providing the beams with "uniform" cell sizes.

Claims 3-7 and 9-10 depend directly or indirectly from Claim 1 and, are therefore, allowable for generally the same reasons as set forth above with respect to Claim 1 and, further, due to the additional limitations recited therein.

Claim 12 is allowable over the references for generally the same reasons discussed above with respect to Claim 1, and, additionally Claim 12 recites a system in which a second plurality of satellites is deployed after the first plurality of satellites located in an elliptical sub-geosynchronous orbit with respect to the earth to provide a second system capacity greater than the first system capacity. As mentioned previously, in the *Taormina* reference, satellites in inclined orbits are used after the initial deployment(s), as the business

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demands on the system increase and result in a requirement for additional satellites, when spacing between the satellites of previous deployments becomes too small. The inclined orbit satellites of the *Taormina* reference, do not appear to be deployed in the first deployment.

Claims 13-15, 17, 19 and 20 depend directly or indirectly from Claim 12 and are therefore allowable for generally the same reasons as set forth above with respect to Claim 12 and, further, due to the additional limitations recited therein.

Regarding Claims 3 and 13, the Examiner alleges that, "Taormina also discloses that the uniform cells are substantially fixed within the service area (see col.2, lines 41-42)". However, it is noted that col. 2, lines 41-42 does not appear to support the Examiner's allegation since it merely reads as follows:

"The present invention provides a satellite communications system which provides global network services to fixed and mobile users."

Regarding Claims 4 and 14, the Examiner alleges that "Taormina also discloses the plurality of beams providing equal capacity density to the cell size (see fig. 6; col. 5, lines 66-67; col. 6, lines 1-5)". However, Fig. 6 of the *Taormina* reference is described therein as a map of the world with various elevation angles of coverage and the coverage for four satellites at an altitude of 10000 km on the equatorial plane is illustrated. Again, Applicant fails to see how this description supports the Examiner's allegation.

Regarding Claims 9-10 and 19-20, the Examiner alleges that, "Taormina also discloses that the plurality comprises less than 9 satellites; and the plurality comprises 4 satellites (see col. 8, lines 25-28)". It is noted that Claim 17 of the *Taormina* reference to which the Examiner is pointing specifically recites:

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"first deploying at least four satellites in a medium earth orbit in the equatorial plane to provide semi-global coverage; and

subsequently deploying, responsive to demand for greater capacity, at least a second plurality of satellites into the same medium earth orbit as the at least four satellites, each satellite of said second plurality of satellites being interleaved between adjacent ones of said at least four satellites."

The configuration of Claim 17 of the *Taormina* reference neither teaches nor suggests the present claims for reasons discussed earlier although "at least four satellites" are deployed in a first deployment. For example, in this section, the *Taormina* reference specifically recites a first deployment of satellites in a medium earth orbit in the equatorial plane whereas Claim 12 of the present application is specifically reciting a first deployment of satellites in an elliptical sub-geosynchronous orbit. It appears that the Examiner is merely selectively picking up bits and pieces from this reference with hindsight gained from the teachings of the present application.

Regarding Claim 22, in addition to the arguments made earlier with respect to Claim 1, the *Taormina* reference neither teaches nor suggests providing a system of inclined eccentric sub-geosynchronous satellites in the manner recited in Claim 22. For example, in Claim 22, there is a handing over operation from a first satellite in an inclined eccentric sub-geosynchronous orbit to another satellite in an inclined eccentric sub-geosynchronous orbit to maintain at least the minimum elevation angle. The *Roederer* reference does not cure this deficiency.

Claim 23 depends from Claim 12 and should be allowable for reasons discussed above in connection with Claims 1 and 12 and further due to the additional limitation recited therein.

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Claims 25 and 32 are allowable over the cited references for generally the same reasons discussed above in connection with Claim 1, and Claims 26-31 and Claims 33-34 which depend, directly or indirectly, from Claim 25 and Claim 32, respectively, are allowable for generally the same reasons.

Claim 2 is being rejected under 35 U.S.C. 103(a) as being unpatentable over *Taormina et al.* (U.S. Patent No. 6,257,526) in view of *Roederer et al.* (U.S. Patent No. 5,151,706) and further in view of *Byrne et al.* (U.S. Patent No. 5,990,883).

It is respectfully submitted that Claim 2 is allowable over these references since the *Byrne* reference does not cure the deficiencies of the teachings of the first two references as discussed earlier in connection with Claim 1.

Claims 8 and 18 are being rejected under 35 U.S.C. 103(a) as being unpatentable over *Taormina et al.* (U.S. Patent No. 6,257,526) in view of *Roederer et al.* (U.S. Patent No. 5,151,706) and further in view of *Schloemer* (U.S. Patent No. RE37140).

Claims 8 and 18 are reciting disabling a satellite when it is coextensive with a geostationary orbit. Although the Examiner alleges that, "Schloemer discloses the satellites are disabled when coextensive with a geostationary orbit (see col.2, lines 45-50)", the *Schloemer* reference merely discusses satellites that accidentally end up in an improper orbit and ground control systems to insure that all satellite stay in correct orbits "and to disable a satellite when it is not in the proper grid orbit". This neither teaches nor suggests disabling a satellite when coextensive with a geostationary orbit, as would happen for example in a defined GSO Crossing Zone. Furthermore, it is

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respectfully submitted that Claims 8 and 18 are allowable over these references since the *Schloemer* reference does not cure the deficiencies of the teachings of the other references as discussed earlier in connection with Claims 1 and 12 and therefore Claims 8 and 18 are allowable generally for the same reasons discussed in connection with Claims 1 and 12 and further due to the additional limitations recited therein.

Claims 11 and 21 are being rejected under 35 U.S.C. 103(a) as being unpatentable over *Taormina et al.* (U.S. Patent No. 6,257,526) in view of *Roederer et al.* (U.S. Patent No. 5,151,706) and further in view of *Castiel et al.* (U.S. Patent No. 6,263,188).

Claim 11 depends from Claim 1 and Claim 21 depends from Claim 12 and both are believed to be allowable for generally the same reasons discussed above in connection with Claims 1 and 12 and further due to the additional limitations recited therein. The *Castiel* reference does not cure the deficiencies of the teachings of the other references as discussed earlier in connection with Claims 1 and 12.

Claims 16 and 24 are being rejected under 35 U.S.C. 103(a) as being unpatentable over *Taormina et al.* (U.S. Patent No. 6,257,526) in view of *Roederer et al.* (U.S. Patent No. 5,151,706) and further in view of *Wainfan et al.* (U.S. Patent No. 6,339,707).

Claim 16 depends from Claim 12 and Claim 24 depends from Claim 22. Both are believed to be allowable for generally the same reasons discussed above in connection with Claims 12 and 22 and further due to the additional limitations recited therein. The *Wainfan* reference does not cure the deficiencies of the teachings of the other references as discussed earlier in connection with Claims 12 and 22.

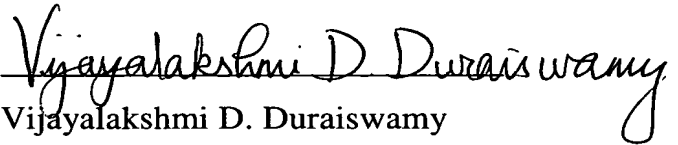
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In light of the remarks above, Applicant submits that all rejections are now overcome. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments which would place the application in better condition for allowance, he is respectfully requested to call the undersigned attorney.

Respectfully submitted,

  
Vijayalakshmi D. Duraiswamy

Reg. No. 31,505

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HUGHES ELECTRONICS CORPORATION

RE/R11/A109

P. O. Box 956

El Segundo, CA 90245

Telephone: (310) 964-0733